

In re Patent Application of:
WALTERS ET AL
Serial No. 10/696,138
Filed: 10/29/2003

IN THE CLAIMS:

Claims 1-13 (cancelled).

14. (new) A method of supplying power to a load comprising the steps of:

(a) providing a multiphase DC-DC converter having a plurality of DC-DC converter channels, outputs of which are combined at an output node to provide a composite DC current to said load, said plurality of DC-DC converter channels including a first, high efficiency channel having a first, relatively high power conversion efficiency and a first response time, and one or more second fast response time channels, each having a second power conversion efficiency less than said first, relatively high power conversion efficiency, and a second response time that is faster than said first response time;

(b) simultaneously and continuously controlling each of said high efficiency channel and said one or more second fast response time channels by way of a single control loop, which monitors said output node and continuously enables each of said high efficiency channel and said one more fast response time channels, so as to cause said high efficiency channel to supply one-hundred percent of leakage current for a light load current condition and, in response to a dynamic increase in current demand from said leakage value to a full load current value, said one more fast response time channels responds by handling said full load current value, so as to realize a composite load current at said output node

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comprised of said leakage current and said full load current.

15. (new) The method according to claim 14, wherein said high efficiency channel has a larger output inductance than said one or more fast response time channels.

16. (new) A multiphase DC-DC power converter for supplying power to a load comprising:

a plurality of DC-DC converter channels, outputs of which are combined at an output node to provide a composite DC current to said load, said plurality of DC-DC converter channels including a first, high efficiency channel having a first, relatively high power conversion efficiency and a first response time, and one or more second fast response time channels, each having a second power conversion efficiency less than said first, relatively high power conversion efficiency, and a second response time that is faster than said first response time; and

a single control loop, which monitors said output node and simultaneously and continuously enables each of said high efficiency channel and said one more fast response time channels, so as to cause said high efficiency channel to supply one-hundred percent of leakage current for a light load current condition and, in response to a dynamic increase in current demand from said leakage value to a full load current value, to cause said one more fast response time channels to respond by handling said full load current value, so as to realize a composite load current at said output node comprised of said leakage current and said full load

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current.

17. (new) The multiphase DC-DC power converter according to claim 16, wherein said high efficiency channel has a larger output inductance than said one or more fast response time channels.